

\* NOTICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the communications control method in the composition connected by the gateway which two or more networks doubled.

[0002]

[Description of the Prior Art] An example of the network configuration by which two or more networks were connected to drawing 2 by the doubled gateway is shown. In the network configuration shown in drawing 2, in order to secure communicative reliability, the gateways 3a and 3b which connect a network 1 and a network 2 are doubled. For this reason, even if one gateway breaks down, connection between networks is not cut by using the gateway of another side which is standing by.

[0003] Conventionally, in the network which the gateway has doubled, the method of communicating using either preferentially is used. For example, in drawing 2, it is the case where gateway 3a is used preferentially, and in case it communicates from computer 11a of a network 1 to computer 21a of a network 2, computer 11a transmits a packet to gateway 3a.

[0004] Here, when gateway 3a is out of order, since the transmission to gateway 3a went wrong, computer 11a can detect failure. The point acting as intermediary will be changed to gateway 3b, and computer 11a will transmit, if gateway 3a which was being used preferentially is out of order.

[0005] On the other hand, in order to check whether gateway 3b is preferentially out of order while in use in gateway 3a, in the former, it is carried out by asking [ gateway 3b ] soundness periodically, for example from computer 21a.

[0006]

[Problem(s) to be Solved by the Invention] Thus, by the conventional communications control method, when computer 21a was using gateway 3a preferentially and it was going to discover failure of gateway 3b in early stage, soundness needed to be frequently asked from computer 21a to gateway 3b. Consequently, the number of times of transmission from computer 21a increased, and there was a problem of a communication load rising and reducing the response of a network.

[0007] this invention aims at offering the communications control method of the doubleness gateway which can detect failure of the doubled gateway at an early stage, without having been made in consideration of the above situations and increasing a communication load.

[0008]

[Means for Solving the Problem] The computer by which this invention is connected to each of two or more networks and the aforementioned network, It is the communications control method in the communication composition in which the doubled gateway which connects between adjoining networks and performs packet switching was prepared. The step which changes the gateway of a transmission place for every event of transmission in case a packet is transmitted to the computer of another network from the computer on a certain network, When a packet is transmitted to one gateway of the point changed by this step from a computer and the transmitting error over the gateway is detected by the computer, it is characterized by having the step which uses the gateway of another side preferentially.

[0009]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained with

## BEST AVAILABLE COPY

reference to a drawing. Drawing 1 is a flow chart for explaining operation of the communications control method of the doubleness gateway concerning this operation gestalt. Moreover, drawing 2 is the block diagram showing an example of the network structure to which the communications control method of the doubleness gateway in this operation gestalt is applied.

[0010] The network structure shown in drawing 2 has secured communicative reliability by connecting a network 1 and a network 2 by the doubled gateways 3a and 3b. For this reason, connection between networks is not cut by using the gateway of another side which is standing by even if one gateway breaks down.

[0011] The network 1 contains the computers 21a, 21b, and 21c of plurality [ network / 2 ] including two or more computers 11a, 11b, and 11c. Each computer can transmit and receive a packet mutually between alien machines. In case a packet is transmitted and received between the computers on a different network, it is carried out through one of the gateways 3a and 3b.

[0012] Here, the communications control method in the network configuration in which the doubled gateways 3a and 3b were formed is explained, referring to the flow chart shown in drawing 1.

[0013] Here, from computer 11a of a network 1, the case where it transmits to computer 21a of a network 2 is made into an example, and it explains. Each computer of each networks 1 and 2 is performed changing to any of the gateways 3a and 3b which doubled the gateway made into a transmission place they are, whenever the event which transmits a packet to the computer of other networks occurs.

[0014] First, computer 11a takes out the transmitting result to last gateway 3b (Step S1). Computer 11a judges whether gateway 3b is out of order from the taken-out transmitting result. Here, it is recorded that it was a transmitting error as a transmitting result, and when it is judged that it is out of order, processing is moved to Step S7 (Step S2).

[0015] When it is judged that gateway 3b is not out of order from the taken-out transmitting result on the other hand, computer 11a takes out the transmitting result of last gateway 3a similarly (Step S3).

[0016] Computer 11a judges whether gateway 3a is out of order from the taken-out transmitting result. Here, it is recorded that it was a transmitting error as a transmitting result, and when it is judged that it is out of order, processing is moved to Step S8 (Step S4).

[0017] When it is judged that gateway 3a is not out of order from the taken-out transmitting result on the other hand, it investigates which computer 11a should use between gateway 3a or gateway 3b by taking out record of the gateway used when transmitting a packet to the computer on other networks last time (Step S5).

[0018] Computer 11a moves processing to Step S8, when the gateway used last time is gateway 3a. When that is not right, processing is moved to Step S7 (Step S6).

[0019] When control is moved to Step S7, computer 11a chooses gateway 3a as the gateway to be used. Moreover, when control is moved to Step S8, computer 11a chooses gateway 3b as the gateway to be used.

[0020] That is, whenever computer 11a has the event which all transmits a packet to the computer on the network 2 where Gateways 3a and 3b differ when normal, it will change the gateway for transmitting a packet.

[0021] Computer 11a receives any of selected gateway 3a or gateway 3b they are, and transmits the packet of computer 21a \*\* on a network 2 (Step S9).

[0022] Computer 11a records the transmitting result of the selected gateway, and updates a record result (Step S10). Here, when a transmitting error is detected, computer 11a records that it was a transmitting error as a transmitting result. Therefore, by performing again transmission of the packet to computer 21a which was a transmitting error by processing from Step S1 mentioned above, the gateway of different another side from the gateway used when a transmitting error was made is chosen, and transmission of a packet is performed.

[0023] Thus, the gateway used as a point acting as intermediary whenever a transmitting error is not detected, but a transmitting event occurs in a computer about both the doubled gateways 3a and 3b, when normal is used, changing by turns. Failure of the gateway is detected, when one gateway breaks down and the transmitting event from a computer which was going to transmit the packet using this broken gateway occurs.

[0024] In this way, since failure is detected by the doubled gateways 3a and 3b being used by turns,

it is not necessary to ask source from a computer to the gateway separately. About the gateway as which failure was detected, use is once stopped, and transmission can be continued by using the gateway with normal another side preferentially.

[0025]

[Effect of the Invention] When one side breaks down without raising the load of communication of a computer in order to use it for every event of transmission according to this invention, changing the doubled gateway, as explained in full detail above, the failure can be detected at an early stage immediately.

---

[Translation done.]

\* NOTICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

CLAIMS

---

[Claim(s)]

[Claim 1] The communications control method in the communication composition in which the doubled gateway which connects between adjoining networks with two or more networks and the computer connected to each of the aforementioned network characterized by providing the following, and performs packet switching was prepared. The step which changes the gateway of a transmission place for every event of transmission in case a packet is transmitted to the computer of another network from the computer on a certain network. The step which uses the gateway of another side preferentially when a packet is transmitted to one gateway of the point changed by this step from a computer and the transmitting error over the gateway is detected by the computer.

---

[Translation done.]